



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

Address: COMMISSIONER FOR PATENTS

P.O. Box 1450

Alexandria, Virginia 22313-1450

www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/587,870

12/18/2006

Heikki Heikkila

17195Z

2548

23389

7590

03/02/2010

SCULLY SCOTT MURPHY & PRESSER, PC

400 GARDEN CITY PLAZA

SUITE 300

GARDEN CITY, NY 11530

EXAMINER

HANLEY, SUSAN MARIE

ART UNIT

PAPER NUMBER

1651

MAIL DATE

DELIVERY MODE

03/02/2010

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

## Application No.

10/587,870

## Applicant(s)

HEIKKILA ET AL

## Examiner

SUSAN HANLEY

## Art Unit

1651

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 23 November 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-77, 80 and 81 is/are pending in the application.
- 4a) Of the above claim(s) 62-69, 72-77, 80 and 81 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-61, 70 and 71 is/are rejected.
- 7) ☒ Claim(s) 1, 29, 34-38 and 70 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 07/28/2008.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

Claims 1-77, 80 and 81 are presented for examination.

#### ***Election/Restrictions***

Applicants' election with traverse of Group I, claims 1-61, 70 and 71, that the optional step of neutralization is not performed and that the source of the vegetable rich fiber is exudate gum wherein the gum is arabic species in the reply filed on 11/23/09 is acknowledged. The traversal is on the ground(s) that the groups represent a single inventive concept since L-arabinose is recovered from the process and the process of Group I includes a crystallization step. Applicants argue that they should be given the opportunity to argue the merits of the inventive step during prosecution. Applicants assert that the IA did not require a lack of unity. Applicants argue that the claims must be considered with all of its limitations. Applicants submit a copy of a product which is alleged to be crystalline arabinose which has a melting point of 154-159 degree C. Applicants submit that there is no search burden to search all of the Groups. Applicants argue that the species have unity of invention. All of the steps are related to the recovery of arabinose and all of the sources of arabinose contain arabinose.

The argument against the lack of unity of the groups is not found persuasive because the Groups do not represent a single inventive concept since L-arabinose, as claimed, is known in the prior art (US 4,816,078). The prior art arabinose inherently has all of the claimed characteristics since it is a purified arabinose and the burden is shifted to Applicants to prove that the subject matter shown to be in the prior art does not possess characteristics relied upon. Applicants have not made a direct comparison with

the L-arabinose that was relied upon in the prior art. The comparison with the L-arabinose cited by Applicants is not relevant since it is not the L-arabinose cited to show lack of unity.

Search burden is not a component of lack of unity. It is required only that the lack of an inventive concept exists between the groups. This has been shown. Whether or not the IA made a lack of unity, this does not have a bearing on the prosecution of the national stage application. Lack of unity is part of the process of prosecution and Applicants are now arguing their point. Regarding the group related to crystallization (Group II), a national stage application containing claims to different categories of invention will be considered to have unity of invention if the claims are drawn to one of the named categories. In the instant lack of unity, the category met was a product and a method of making. The crystallization process (Group II) is a separate group since is drawn to an additional method. Single-stage boiling is not recited in claim 1. Hence, there is no special technical feature between the groups.

The arguments regarding the specie are deemed persuasive and the species are rejoined.

The requirement is still deemed proper and is therefore made FINAL.

Claims 62-69, 72-77, 80 and 81 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected inventions, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on 11/23/2009.

Claims 1-61, 70 and 71 are presented for examination.

***Claim Suggestion***

It is suggested that the verbs that accomplish an action in the method steps (e.g. "hydrolysis", "neutralization", "separation", "fractionization" and "crystallization") be expressed in the active tense (e.g., "hydrolyzing", etc.).

***Claim Objections***

Claims 34-38 and 70 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The independent claim is drawn to a method for the recovery of arabinose. Claims 34-38 are drawn to further step for the recovery of other carbohydrates. Claim 70 is drawn to an epimerization step. These steps are not related to the recovery of arabinose. Therefore they fail to further limit the independent claim.

Claim 1 is objected to because "arab- inose", "op -tionally", "hy -drolyzate" and "ob -tained" are not words.

Claim 29 is objected to because the acids are misrepresented by the recited chemical formulae. The formulae recite a zero ("0") and not an "O".

Claim 1 recites the abbreviation "DS". An abbreviation should be preceded in its first occurrence by the specific identity of the entity which said abbreviation is intended to represent. Thereafter, the use of the abbreviation in the claims will be understood.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-61, 70 and 71 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites the limitation "said aqueous hydrozylate" in 10. There is insufficient antecedent basis for this limitation in the claim.

Claim 1 recites the limitation "undissolved solids" in 12. There is insufficient antecedent basis for this limitation in the claim.

The terms "rich" which is recited in claims 1, 2, 4, 6, 7 and 9; "strongly" in claims 22, 23, 28 and 29; "controlled" in claim 1, "weakly" in claims 24, 25 and 27 are relative terms which render the claims indefinite. The terms are not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim 1 is rejected because it is optional but part (c) of the claim appears to require said step (b).

Claims 1, 10 and 12 are rejected because the term "controlled" is vague and indefinite. It is unclear how the hydrolysis is controlled.

Claim 49 is rejected because the term "single-stage" is vague and indefinite. It is not clear if the boiling is the only step or if there is some other intended meaning.

The remaining claims are rejected because they are dependent claims that do not overcome the deficiencies of the rejected independent claim from which they depend.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The claims are drawn to a method for the recovery of arabinose from a vegetable rich fiber that can be an exudate gum that is gum ghatti (instant claims 1, 4, 5, 9 and 39) by acidic hydrolysis of the fiber, separation the undissolved solid and crystallization of the clarified hydrolyzate. Content of arabinose in the vegetable fiber is recited (claims 2 and 3). Various degrees of purity of the recovered arabinose are recited (instant claims 12-16 and 33). Yields of arabinose from the hydrolysis are recited (instant claims 10, 11 and 59-61). The acid is sulfuric acid at 0.1-5% (instant claims 17 and 18). Degrees of purity from the crystallization are disclosed (instant claims 41-48, 51-58). The recovered arabinose is L-arabinose (instant claim 71).

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-5, 9-18, 33, 39, 41, 44-48, 51-61 and 71 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Ingle et al. (1985; hereafter "Ingle").

Ingle discloses the preparation of L-arabinose (instant claim 71) from gum ghatti (instant claims 4 and 5) by acidic hydrolysis with 0.3 % sulfuric acid (instant claims 1(a), 17 and 18), neutralizing the hydrolyzate (claim 1(b)); filtering the hydrolyzed arabinose to remove bark (instant claim 1(c) and crystallizing the recovered hydrolyzate (instant claim 1(d); pages 370, right col. to 371 (left col., first para). Ingle teaches a slight impurity of galactose along with the crystallized arabinose (p. 371, left col., third para.; instant claims).

Ingle is silent regarding the content of the arabinose in the gum but meets the claimed limitations which indicates that the claimed characteristics should be present in the prior art invention as also as those instantly claimed. In this case, burden is shifted to the Applicant to distinguish the instant invention over the prior art. It is noted that In re Best (195 USPQ 430) and In re Fitzgerald (205 USPQ 594) discuss the support of rejections wherein the prior art discloses subject matter which there is reason to believe inherently includes functions that are newly cited or is identical to a product instantly claimed. In such a situation the burden is shifted to the applicants to "prove that subject matter shown to be in the prior art does not possess characteristic relied on" (205 USPQ 594, second column, first full paragraph).

Ingle does not teach the yields of or the degree of purity of the arabinose from the various steps of the process. However, said yields and degrees of purity would naturally follow from the method of Ingle because Ingle practices the claimed steps.



Claims 1-3, 6, 9-18, 20-29, 32, 33, 40, 44-48, 51-54, 60, 61 and 71 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Antila et al. (US 6,506,897; hereafter "Antila"; cited in the IDS filed 7/28/09).

Claims 20-29 are further drawn to the purification of the filtered arabinose on anionic or cationic exchange resins.

Antila discloses the recovery of L-arabinose (instant claim 71) by the basic extraction of sugar beet (instant claim 6), hydrolysis with an acid, neutralization, filtration followed by purification on a cationic that can be Na<sup>+</sup> or anionic resin (instant claims 1 and 20-28). The term "comprising" is open language. Hence, the prior art can contain additional elements (extraction with base) that are encompassed by, but not specifically named, by the claims. The acid is sulfuric acid at a pH of 0.8 (instant claims 17 and 18). The purity of the crystallized arabinose was 98%; the yield was 10%; there is no contaminating galactose mentioned (col. 3, line 42; instant claims 44-48, 50-54, 60 and 61).

Antila is silent regarding the content of the arabinose in the sugar beet pulp but meets the claimed limitations which indicates that the claimed characteristics should be present in the prior art invention as also as those instantly claimed. In this case, burden is shifted to the Applicant to distinguish the instant invention over the prior art. It is noted that *In re Best* (195 USPQ 430) and *In re Fitzgerald* (205 USPQ 594) discuss the support of rejections wherein the prior art discloses subject matter which there is reason to believe inherently includes functions that are newly cited or is identical to a product instantly claimed. In such a situation the burden is shifted to the applicants to "prove

that subject matter shown to be in the prior art does not possess characteristic relied on" (205 USPQ 594, second column, first full paragraph).

Antila does not teach the yield of arabinose from the hydrolysis step. However, said yield would naturally follow from the method of Antila because Antila practices the claimed steps.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-5, 9-19, 30, 31, 33, 39, 44-48, 51-56, 56-61 and 71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ingle et al. (1985; "Ingle"), as applied to

claims 1-5, 9-18, 33, 39, 41, 44-48, 51-61 and 71, in view of Heikkila et al. (US 2002/0153317.; noted in the IDS filed 7/28/06: hereafter "Heikkila").

The disclosure by Ingle is discussed supra.

Ingle does not teach that the fractionization is carried out by nanofiltration (instant claims 30 and 31) and that the hydrolysis is carried out at a temperature of 70 to 140 degrees at a pH of 0.7 to 2.5 for 0.4 to 6 hours (instant claim 19).

Heikkila discloses that arabinose can be recovered from a mixture by nanofiltration. Disaccharides are removed by the process (section [0103]).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to carry out the filtration process of Ingle by nanofiltration. The ordinary artisan would have been motivated to do so because Heikkila teaches that it is effective to remove contaminants as small as disaccharides. The ordinary artisan would have had a reasonable expectation that one could subject a solution containing arabinose to nanofiltration to remove poly-, oligo- and/or disaccharides since Heikkila teaches that the method is effective to remove even the smallest of sugars including disaccharides.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to carry out the acidic hydrolysis of the arabinose-containing material of Ingle at a temperature of 70 to 140 degrees at a pH of 0.7 to 2.5 for 0.4 to 6 hours. One of ordinary skill in the art would recognize that hydrolysis of an arabinose-containing material is a result effective variable dependant on the degree and quality of the hydrolyzed arabinose that is desired. Absent any teaching of criticality by the

Applicant concerning the hydrolysis, it would be prima facie obvious that one of ordinary skill in the art would recognize these limitations are result effective variable which can be met as a matter of routine optimization (MPEP § 2144.05 II).

Claims 1-3, 6, 9-19, 20-33, 40, 44-48, 51-54, 60, 61 and 71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Antila et al. (US 6,506,897; hereafter "Antila"; cited in the IDS filed 7/28/09) as applied to claims 1-3, 6, 9-18, 20-29, 32, 33, 40, 44-48, 51-54, 60, 61 and 71, in view of Heikkila et al. (US 2002/0153317. cited in the IDS filed 7/28/06: hereafter "Heikkila").

The disclosure by Antila is discussed supra.

Antila does not teach that the fractionization is carried out by nanofiltration (instant claims 30 and 31) and that the hydrolysis is carried out at a temperature of 70 to 140 degrees at a pH of 0.7 to 2.5 for 0.4 to 6 hours (instant claim 19).

Heikkila discloses that arabinose can be recovered from a mixture by nanofiltration. Disaccharides are removed by the process (section [0103]).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to carry out the filtration process of Antila by nanofiltration. "he ordinary artisan would have been motivated to do so because Heikkila teaches that it is effective to remove contaminants as small as disaccharides. The ordinary artisan would have had a reasonable expectation that one could subject a solution containing arabinose to nanofiltration to remove poly-, oligo- and/or disaccharides since Heikkila

teaches that the method is effective to remove even the smallest of sugars including disaccharides.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to carry out the acidic hydrolysis of the arabinose-containing material of Antila at a temperature of 70 to 140 degrees at a pH of 0.7 to 2.5 for 0.4 to 6 hours. One of ordinary skill in the art would recognize that hydrolysis of an arabinose-containing material is a result effective variable dependant on the degree and quality of the hydrolyzed arabinose that is desired. Absent any teaching of criticality by the Applicant concerning the hydrolysis, it would be prima facie obvious that one of ordinary skill in the art would recognize these limitations are result effective variable which can be met as a matter of routine optimization (MPEP § 2144.05 II).

Claims 1-5, 9-18, 30, 39, 41-48, 50-56, 56-61 and 71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ingle et al. (1985; "Ingle"), as applied to claims 1-5, 9-18, 33, 39, 44-48, 51-61 and 71, in view of Burdet et al. (US 2001/0018544, hereafter "Burdet") and Korosi et al. (US 4,835,152; hereafter "Korosi").

The disclosure by Ingle is discussed supra.

Ingle does not teach that the crystals are obtained by boiling the crude, cooling the mixture and washing the crystals (instant claims 41-43 and 50).

Korosi teaches that purified, crystalline benzodiazapine derivatives can be obtained by boiling crude crystals, cooling the solution and washing the resulting crystals (col. 6, lines 61-64).

Burdet teaches that a careotoid derivative in a reaction mixture was boiled, cooled to room temperature to obtain crystals, filtered and washed to yield the desired crystals (section [0195]).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to carry out the crystallization step of the method Ingle by boiling the crude arabinose to dissolve it, allowing it to cool to obtain crystals and washing the crystal. The ordinary artisan would have been motivated to do so because the prior art (Korosi and Burdet) show that this is a common method to crystallize crude substances from widely varying types of compounds (benzodiazapines vs. carotenoids). The ordinary artisan would have had a reasonable expectation that prior art crystallization method would be successful with L-arabinose because it is based on a well know principle of crystallization.

Claims 1-3, 6, 9-19, 20-29, 32, 33, 40-48, 50-54, 60, 61 and 71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Antila et al. (US 6,506,897; hereafter "Antila"; cited in the IDS filed 7/28/09) as applied to claims 1-3, 6, 9-18, 20-29, 32, 33, 40, 44-48, 51-54, 60, 61 and 71, in view of Burdet et al. (US 2001/0018544, hereafter "Burdet") and Korosi et al. (US 4,835,152; hereafter "Korosi").

The disclosure by Antila is discussed supra.

Antila does not teach that the crystals are obtained by boiling the crude, cooling the mixture and washing the crystals (instant claims 41-43 and 50).

Korosi teaches that purified, crystalline benzodiazapine derivatives can be obtained by boiling crude crystals, cooling the solution and washing the resulting crystals (col. 6, lines 61-64).

Burdet teaches that a carotenoid derivative in a reaction mixture was boiled, cooled to room temperature to obtain crystals, filtered and washed to yield the desired crystals (section [0195]).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to carry out the crystallization step of the method Antila by boiling the crude arabinose to dissolve it, allowing it to cool to obtain crystals and washing the crystal. The ordinary artisan would have been motivated to do so because the prior art (Korosi and Burdet) show that this is a common method to crystallize crude substances from widely varying types of compounds (benzodiazapines vs. carotenoids). The ordinary artisan would have had a reasonable expectation that said crystallization method would be successful because it is based on a well know principle of crystallization.

Claims 1-5, 7, 9-18, 33, 39, 41, 44-48, 51-56, 56-61 and 71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ingle et al. (1985; "Ingle"), as applied to claims 1-5, 9-18, 33, 39, 41, 44-48, 51-61 and 71, in view of Park et al. (2001; hereafter "Park").

The disclosure by Ingle is discussed supra.

Ingle does not teach that the hydrolysis is carried out by enzymes (instant claim 1) or that the source of the arabinose is corn fibers (instant claim 7).

Park teaches a method for the preparation of L-arabinose wherein the hydrolysis step of the arabinoxylan material from corn fiber is accomplished by a crude enzyme containing beta-xylanase, beta-xylosidase and alpha-L-arabinofuranosidase. The resulting hydrolyzate contains arabinose, xylose and small amounts of other saccharides. The crude is then subjected to reaction with a microorganism to eliminate the xylose. The arabinose is then subjected to cation and anion exchange resins.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to carry out the hydrolysis of the arabinose-containing vegetable fiber from corn by an enzymatic instead of by acidic hydrolysis in the method of Ingle. The ordinary artisan would have been motivated to do so because each method is known to have the same function (hydrolysis of a vegetable fiber to yield L-arabinose). Hence, the substitution of the enzymatic method for the acidic hydrolysis procedure is no more than the predictable use of prior art elements according to their established functions resulting in the simple substitution of one known element for another for a predictable result. The ordinary artisan would have had a reasonable expectation that one could successfully enzymatically hydrolyze a vegetable fiber to L-arabinose because Park teaches the successful accomplishment of this objective.

The ordinary artisan would have been motivated to employ corn fiber as the source of arabinose in the method of Ingle since corn fiber is a source of arabinose. The



ordinary artisan would have had a reasonable expectation that one could successfully obtain arabinose from corn fiber since Park is able to accomplish this.

Claims 1-3, 6, 7, 9-19, 20-29, 32, 33, 40-48, 50-54, 60, 61 and 71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Antila et al. (US 6,506,897; hereafter "Antila"; cited in the IDS filed 7/28/09) as applied to claims 1-3, 6, 9-18, 20-29, 32, 33, 40, 44-48, 51-54, 60, 61 and 71, in view of Park et al. (2001; hereafter "Park").

The disclosure by Antila is discussed supra.

Antila does not teach that the hydrolysis step is carried out by enzymes (instant claim 1) or that the source of the arabinose is corn fibers (instant claim 7).

Park teaches a method for the preparation of L-arabinose wherein the hydrolysis step of the arabinoxylan material from corn fiber is accomplished by a crude enzyme containing beta-xylanase, beta-xylosidase and alpha-L-arabinofuranosidase. The resulting hydrolyzate contains arabinose, xylose and small amounts of other saccharides. The crude is then subjected to reaction with a microorganism to eliminate the xylose. The arabinose is then subjected to cation and anion exchange resins.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to carry out the hydrolysis of the arabinose-containing vegetable fiber in the method of Antila by an enzymatic method instead of by acidic hydrolysis. The ordinary artisan would have been motivated to do so because each method is known to have the same function (hydrolysis of a vegetable fiber to yield L-arabinose). Hence, the substitution of the enzymatic method for the acidic hydrolysis procedure is

no more than the predictable use of prior art elements according to their established functions resulting in the simple substitution of one known element for another for a predictable result. The ordinary artisan would have had a reasonable expectation that one could successfully enzymatically hydrolyze a vegetable fiber to L-arabinose because Park teaches the successful accomplishment of this objective.

The ordinary artisan would have been motivated to employ corn fiber as the source of arabinose in the method of Antila since corn fiber is a source of arabinose. The ordinary artisan would have had a reasonable expectation that one could successfully obtain arabinose from corn fiber since Park is able to accomplish this.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SUSAN HANLEY whose telephone number is (571)272-2508. The examiner can normally be reached on M-F 9:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Wityshyn can be reached on 571-272-0926. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Susan Hanley/  
Examiner, Art Unit 1651

/Michael G. Wityshyn/  
Supervisory Patent Examiner, Art Unit 1651